

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of)	
)	
Wireless Telecommunications Bureau,)	GN Docket No. 18-122
International Bureau, Office of Engineering)	RM-11791
and Technology, and Office of Economics)	RM-11778
and Analytics Seek Focused Additional)	
Comment in 3.7-4.2 GHz Band Proceeding)	
)	

COMMENTS OF VERIZON

William H. Johnson
Of Counsel

Gregory M. Romano
VERIZON
1300 I Street, NW
Suite 500 East
Washington, DC 20005
(202) 515-2574

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I. INTRODUCTION AND SUMMARY.

The Commission’s second 3.7-4.2 GHz public notice in three months reflects that we are closing in on resolving this critical proceeding and advancing toward the introduction of substantial mid-band spectrum into the U.S. wireless market. Verizon welcomes the *Public Notice*’s targeted questions that will generate further insight into the specific rules the Commission should adopt and those proposals it should reject.¹

The *Public Notice* seeks a coexistence regime that will protect existing C-Band earth station operations from harmful interference *and* allow new 5G operations to thrive. The key principles to such a regime are as follows:

- Incumbent C-Band earth station operations must be protected, and 5G operations in the 3.7-4.2 GHz band must not interfere with those incumbent C-Band earth stations.
- Overly restrictive, across-the-board, interference protection levels must be avoided; they would require a U.S.-exclusive band designation, diminish the value and utility of C-Band spectrum for 5G deployment, and impair 5G mid-band prospects in the United States.

¹ *Wireless Telecommunications Bureau, International Bureau, Office of Engineering and Technology, and Office of Economics and Analytics Seek Focused Additional Comment in 3.7-4.2 GHz Band Proceeding*, Public Notice, DA 19-678 (rel. July 19, 2019) (“*Public Notice*”).

A solution exists that embodies both of these principles: the Commission should adopt a receiver protection threshold measured at C-Band earth station locations that will protect registered earth stations where needed but otherwise enable flexibility to 5G operators—flexibility to achieve those protection levels only where they are necessary through targeted network design and operational modifications. In this way, mobile operators would operate free from overly restrictive constraints in areas where they cannot impair incumbent earth stations. To ensure protection against interference, 5G operators should create a timely process for C-Band earth station operators or satellite operators to report any incident of harmful interference for prompt remediation around the clock.

With this targeted approach to protect earth stations only where they are located, the Commission need not bifurcate the cleared spectrum into separate ranges with separate rules or create arbitrary distance requirements. And to successfully execute this approach, the Commission should adopt reasonable receiver protection thresholds and ensure they are reasonably applied. With the receiver protection framework in place, it should adopt power levels and out-of-band emission (“OOBE”) limits that reflect 3GPP specifications, allowing the U.S. market to benefit from global standards and products and avoid delay. Adopting power and OOBE limits consistent with 3GPP standards for Band n77 (3.3-4.2 GHz) while targeting protection to the actual earth station ensures that any additional spectrum cleared in this band in the future will not require changes to utilize added frequencies, including possible changes to equipment.

Separately, the *Public Notice* seeks comment on the proposal submitted by ACA Connects – America’s Communications Association, the Competitive Carriers Association, and Charter Communications, Inc. (“ACA/CCA/Charter proposal”). The proposal rightly suggests

reasonable interference protection rules and recognizes fiber as a meaningful alternative to satellite delivery. But a satellite operator-led transition remains the fastest, most streamlined, and least risky approach to repurposing C-Band spectrum.

Finally, the *Public Notice* seeks input on a new point-to-multipoint service, which would doom an important opportunity the Commission should consider: an FCC overlay auction in the FSS-repacked portion of the C-Band. In response to questions raised in the FCC’s July 2018 *Notice of Proposed Rulemaking*,² we expressed concern that an overlay auction would face too many hurdles to clear a portion of the C-Band for flexible-use services. That remains true, but creating an overlay auction in the portion of the band not repurposed for 5G use at the outset (the FSS-repacked portion) would offer a unique opportunity for all relevant players to make more spectrum available. C-Band overlay licensees would be required to protect earth station operators but could negotiate market arrangements to clear them out of the band—perhaps by using fiber as an alternative delivery mechanism. New point-to-multipoint encumbrances in the FSS-repacked band would derail this opportunity.

II. THE FCC SHOULD APPLY A RECEIVER PROTECTION THRESHOLD THAT PROTECTS C-BAND RECEIVERS WHERE THEY EXIST AND PROVIDES 5G LICENSEES WITH OPERATIONAL FLEXIBILITY TO OPTIMIZE USE OF THE CLEARED SPECTRUM.

The *Public Notice* hones in on questions of 5G and satellite co-existence that must be answered to clear 3.7-4.2 GHz spectrum—namely, the appropriate technical parameters for terrestrial base stations and end user devices in the repurposed band, “[g]iven the needs of next-generation wireless networks and the need to ensure continuity of service for current users of

² *Expanding Flexible Use of the 3.7-4.2 GHz Band et al.*, Order and Notice of Proposed Rulemaking, 33 FCC Rcd 6915 (2018) (“2018 NPRM”).

Fixed Satellite Service earth stations.”³ The following principles and proposed framework would take into account elements of CBA’s proposed interference protection proposal⁴ and important goals from AT&T’s alternative approach:⁵

Principles

- Incumbent C-Band earth station operations must be protected, and 5G operations in the 3.7-4.2 GHz band will operate on a non-harmful interference basis to those incumbent C-Band earth stations.
- U.S. 5G mid-band prospects would be severely impaired by imposing overly restrictive, across-the-board, interference protection levels that would require a U.S.-exclusive band designation and diminish the value and utility of the spectrum for 5G deployment.

Framework

- The Commission should adopt a receiver protection threshold measured at C-Band earth station locations that will provide protection where it is needed but otherwise enable flexibility for 5G operators—flexibility to achieve those protection levels only where they are necessary through targeted network design and operational modifications. In this way, mobile operators would operate free from overly restrictive constraints in areas where they cannot impair incumbent earth stations.
- This flexible 5G operating framework does not require pre-approval with earth station operators in order to deploy, expand, or moderate networks—but it does come with a non-harmful interference requirement. To stand behind that commitment, 5G operators will create a 24/7/365 process for C-Band earth station operators or satellite operators to report any incident of harmful interference for prompt remediation.

Receiver Protection Threshold. A receiver protection threshold avoids harmful interference by requiring 5G operators to design their networks as necessary to provide protection at the locations of incumbent C-Band earth stations. As CBA observed:

³ *Public Notice* at 5.

⁴ See Letter from Jennifer D. Hindin, Counsel for the C-Band Alliance, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122, Attachment at 2 (filed Mar. 4, 2019) (“CBA Further Technical Statement”).

⁵ See Letter from Henry G. Hultquist, Vice President, Federal Regulatory, AT&T Services, Inc., to Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122 (filed May 23, 2019) (“AT&T May 23 Ex Parte”).

In order to protect FSS earth station sites, each Flexible Use Licensee will have to ensure that it complies with the aggregate power density levels produced by its stations at existing FSS sites for in-band and out-of-band emissions. This will **not** require any SAS-like system because the calculations will be performed by the Flexible Use Licensees. If the calculations reflect that the limit would be exceeded, the Flexible Use Licensee will adjust the characteristics of its base or fixed station in order to ensure compliance. This can be achieved through a combination of options, such as selecting a specific antenna design, using mechanical or electric down-tilting, dynamic antenna pointing restrictions or power reduction.⁶

In other words, 5G operators can locally modify their network deployments to manage interference to C-Band earth stations. 5G operators have multiple tools to manage their network deployment and coexist with C-Band earth station operations—a far better course than imposing across-the-board restrictive power levels and OOB limits at 5G transmitters. For example, 5G base stations can locally enforce lower transmit power levels on attached end-user devices in the vicinity of a C-Band earth station. Operators can also install small cells and pico cells to significantly reduce the transmit power of the end user devices that are near the earth stations. And software techniques such as load balancing can re-direct end user devices near earth stations to other spectrum bands.

With sophisticated radio propagation modeling capabilities, 5G operators can use network deployment tools on a localized basis without the need for any coordination or approval of C-Band earth station or satellite operators for 5G operations across the cleared spectrum. The ability to use such tools means the Commission need not bifurcate the cleared spectrum into separate band ranges with separate rules,⁷ which would complicate any changes to the band edge between 5G and FSS if additional spectrum is cleared.

⁶ CBA Further Technical Statement at 2.

⁷ AT&T May 23 Ex Parte.

To work, the receiver protection thresholds must be reasonable. Several months ago, CBA submitted highly conservative levels that, if implemented, would restrict the promise of the cleared spectrum for 5G. For example, to address 5G emissions in the earth station passband, CBA proposes that the aggregation of all base and fixed stations deployed by a flexible-use licensee within 40 km of an earth station location must not exceed -128 dBm/MHz in the earth station passband.⁸ It is not clear why protection at the -128 dBm/MHz level is required, or why the threshold should be based on the long distance of 40 km. In reality, distance does not always drive interference; other factors, such as terrain, also play an important role. So, operators should consider distance to be a guideline among other factors, not a requirement. A one-size-fits-all approach to define exclusion zones and calculation methodology can present significant limitations to 5G deployment flexibility.

For CBRS operations in the 3.55-3.7 GHz band, the Commission adopted rules to protect C-Band earth stations operating in the immediately adjacent 3.7-4.2 GHz band. There, adjacent telemetry, command, and control (“TT&C”) operations are protected by the receiver protection rules at specific levels, but standard C-Band receive earth stations are not.⁹ These standard C-Band earth station receivers may request protection to prevent harmful interference into their systems,¹⁰ but CBRS operators are not subject to specific receiver protection criteria measured at each of these adjacent band receivers. As such, it is not clear why such restrictive receiver protection limits would be applied here to the same adjacent band earth station receivers. Similarly, to address blocking at the band edge, CBA proposes that the aggregation of all base

⁸ See CBA Further Technical Statement at 4.

⁹ See 47 C.F.R. § 96.17(b).

¹⁰ See *id.* § 96.17(f).

and fixed stations deployed by a licensee within 40 km of an earth station location must not exceed -81.6 dBm/MHz, which is equivalent to -59 dBm in the 5G band.¹¹ These thresholds should be lower based on developments in earth station filter capabilities, which will better enable 5G deployment while protecting earth station operations.¹²

Just as important as the receiver protection levels themselves is how reasonably they are applied. Verizon highlights several issues to enhance utility of the cleared spectrum without increasing the risk of harmful interference to the C-Band earth:

- CBA’s proposal to apply the receiver protection threshold to a 150-meter protection area surrounding all registered C-Band earth station locations would significantly expand predicted interference levels to protect earth stations that do not exist.¹³ This would have a particularly deleterious effect in dense urban and suburban scenarios. CBA’s reasoning—to ensure that “all antennas at a multi-antenna site are protected” and to “allow earth station operators to add antennas”¹⁴—falls short. The Commission directed that all antennas at a multi-antenna site be registered to address this concern and has imposed a freeze on future C-Band earth stations (while allowing registered earth stations to be modified).¹⁵ Applying the receiver protection threshold only at today’s registered

¹¹ Blocking interference should be assessed across the 5G band and not on an individual 1 MHz block basis, because blocking is caused by total power into the LNB, not by power spectral density on a per MHz basis.

¹² CBA’s proposal that earth stations used for TT&C in 3700-3900 MHz be protected based on 150 km radius, 5° elevation, and a 13-meter antenna is also too conservative. It would impose a protection level for TT&C operations that is 5 dB more conservative than the limit proposed for other operations (-133 dBm/MHz versus -128 dBm/MHz). CBA Further Technical Statement at 4. The FCC determined in the 3.5 GHz Citizens Broadband Radio Service proceeding that TT&C and other operations should be protected at the same level. *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Order on Reconsideration and Second Report and Order, 31 FCC Rcd 5011, 5099 ¶ 298 (2016). And the Commission should require TT&C operations that operate in the 3700-3900 MHz band to migrate to higher frequencies (i.e. the FSS-repacked band) in subsequent generations of satellite stations and that these operations be located in remote locations.

¹³ CBA Further Technical Statement at 11-12.

¹⁴ *Id.* at 2 n.6.

¹⁵ See *International Bureau Announces 90-Day Extension of Filing Window, to October 17, 2018, to File Applications for Earth Stations Currently Operating in 3.7-4.2 GHz Band; Filing Options for Operators with Multiple Earth Station Antennas*, Public Notice, 33 FCC Rcd 6115 (IB 2017); see also *2018 NPRM*, 33 FCC Rcd at 6927 ¶ 30.

receiver locations avoids imposing prohibitive restrictions based on overly conservative assumptions.

- CBA’s proposal to have 5G operators assume up to a 13-meter antenna for their receiver protection calculations¹⁶ is disconnected from the real-world on-site antenna data readily available from ULS (and recently updated per Commission direction), so there is no reason to assume this worst-case antenna scenario. Applying the receiver protection threshold using real-world data avoids imposing unrealistic and prohibitive assumptions in the calculations.
- CBA’s proposal would have 5G operators incorporate “full-arc” protection for earth stations communicating with satellites at elevation angles down to 5°, ¹⁷ without accounting for whether those satellite orbital locations are in use or the longitude of the earth station.¹⁸ Again, 5G operators can incorporate more accurate data into their calculations with real-world information available; doing so will avoid prohibitive requirements based on flawed assumptions.

Power Levels and OOB Limits. With a reasonable receiver protection threshold framework, the Commission need not adopt restrictive power level and OOB limits that would force significant, unnecessary reductions in 5G transmissions (both base station and end-user devices) across all geographies and some, if not all, spectral locations. The drag on 5G would greatly restrict the utility of the band, whereas flexibility and reliance on 3GPP standards-based equipment—while protecting C-Band earth stations where they exist through the receiver protection threshold—will better optimize the 5G opportunity.

The Commission should adopt 3.7-4.2 GHz power levels and OOB limits that will allow use of 3GPP’s Band n77 (3.3-4.2 GHz) specification. These parameters alone do not constitute the interference protection regime, as receiver performance thresholds will dictate 5G operations as measured at C-Band earth station locations. But more restrictive power and OOB levels would require a new band designation within 3GPP that would be U.S.-exclusive,

¹⁶ CBA Further Technical Statement at 2.

¹⁷ *Id.*

¹⁸ AT&T May 23 Ex Parte at 13.

resulting in slower roll-out and more costly equipment. The FCC can adopt power and OOB levels consistent with the Band n77 specification and ensure that C-Band earth stations are protected by applying the receiver protection threshold framework. The Commission should adopt the following parameters:

- For power levels, the Commission should adopt: a 30 dBm power limit for end user devices that will accommodate user equipment built to 3GPP standards and a 75 dBm power limit for base stations that will accommodate network equipment built to 3GPP standards.¹⁹
- For OOB levels, the Commission should adopt its standard unwanted emission level of -13 dBm/MHz, which will accommodate equipment built to the 3GPP standards for both base stations and user equipment that will operate in Band n77. CBA's proposed end-user device OOB levels of -28 dBm at the band edge, -55 dBm/MHz between 20 and 40 megahertz from the band edge, and -65 dBm/MHz beyond 40 megahertz from the band edge would severely impair 5G operations by imposing end-user device transmit power reductions of at least 15 dBm.²⁰

Targeting protection to the actual earth station as we propose also ensures that any future clearing of more spectrum in this band in the future will not require changes to use added frequencies. For instance, it will not require a new U.S.-specific band designation or updated rules for OOB limits and frequency ranges to reflect a new band edge. It will also not require changes to base station equipment filters, integrated base station equipment, or new handsets so the spectrum could be put to use quickly and efficiently.

Process for Ensuring Non-Interference. As noted above, an obligation for 5G operators to operate on a non-harmful interference basis should be supported by a 24/7/365 process to report and remediate any harmful interference to C-Band earth stations. A unified call center with real-time links to the Network Operations Centers of all C-Band licensees could receive

¹⁹ Comments of Verizon, GN Docket No. 18-122, at 23 (filed Oct. 29, 2018) ("Verizon NPRM Comments").

²⁰ Reply Comments of Qualcomm Incorporated, GN Docket No. 18-122, at 3 (filed Dec. 11, 2108).

interference reports from earth station operators and engage the appropriate wireless carriers, working the issue until it is resolved.

Whatever coordination mechanism is ultimately adopted, the key is to place the burden of earth station interference protection on the few flexible use operators instead of the potentially hundreds of millions of end-user devices and base stations. Doing so will make it more feasible for operators to deploy 5G, especially in harder to reach rural areas where C-Band earth stations are few and far between and 5G operators can optimize network design. For example, by adopting OOB standards consistent with Band n77, 5G operators can design networks in rural areas to service end-user devices transmitting at full end-user power (e.g., 30 dBm), thereby maximizing base station coverage. In contrast, overly-restrictive end-user device OOB limits would require significant end-user device power reduction (to levels near 5 dBm) resulting in constrained base station range and increased cell density by a factor of 15, unnecessarily complicating rural deployment.

III. A SATELLITE OPERATOR-LED TRANSITION IS THE FASTEST, MOST STREAMLINED, AND LEAST RISKY APPROACH TO REPURPOSING C-BAND SPECTRUM.

A. The ACA/CCA/Charter Proposal Contains a Reasonable Interference Protection Scheme and a Recognition that Fiber is a Meaningful Alternative to Satellite Delivery.

As discussed below, the ACA/CCA/Charter proposal²¹ contains legal infirmities, lacks specificity, and fails to set a course for repurposing 3.7-4.2 GHz spectrum. But the proposal

²¹ See Letter from Ross Lieberman, Senior Vice President, Government Affairs, ACA Connects – America’s Communications Association, Alexi Maltas, Senior Vice President & General Counsel, Competitive Carriers Association, and Elizabeth Andron, Senior Vice President, Regulatory Affairs, Charter Communications, Inc., to Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122, Cartesian Attachment (filed July 15, 2019) (“ACA/CCA/Charter Cartesian Attachment”); Letter from Ross Lieberman, Senior Vice President, Government Affairs, ACA Connects – America’s Communications Association, Alexi Maltas, Senior Vice President & General Counsel, Competitive Carriers Association,

contains elements that should be part of the final framework the Commission adopts. First, the ACA/CCA/Charter proposal recognizes that successful deployments of 5G networks require a reasonable interference scheme.²² It emphasizes the importance of setting power and OOB limits that protect earth station receivers without negating robust 5G services on repurposed spectrum. Section II, above, expands on these views.

Second, the proposal highlights that fiber is a viable and attractive alternative to C-Band delivery.²³ Today's satellite-delivered content need not be restricted to satellite delivery in the future. As we noted earlier in this proceeding, "much C-band traffic can be transitioned to fiber where fiber is readily available," and "[f]iber offers lower latency than C-band connectivity, greater capacity, and greater security from radio frequency . . . interference."²⁴

Fiber-based content delivery is happening today. Content that is currently delivered via satellites and earth stations need not be restricted to satellite delivery in the future. As stakeholders continue to examine repurposing the band, technological and market-based alternatives should be part of the conversation.

B. The ACA/CCA/Charter Proposal Contains Unanswered Operational and Legal Questions, and a Satellite Operator-Led Transition Represents a Smoother Approach to Repurposing 3.7-4.2 GHz Spectrum.

The ACA/CCA/Charter proposal raises more questions than it answers at a time when stakeholders should be narrowing issues in the proceeding. The crux of the ACA/CCA/Charter

and Elizabeth Andron, Senior Vice President, Regulatory Affairs, Charter Communications, Inc., to Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122 (filed July 2, 2019) ("ACA/CCA/Charter Proposal").

²² ACA/CCA/Charter Proposal at 7-8.

²³ *Id.* at 3-5.

²⁴ Verizon NPRM Comments at 14-15 (citing T-Mobile studies demonstrating that in two illustrative cities, Chicago and Phoenix, all traffic currently received via earth stations can be moved to fiber to ensure uninterrupted delivery, and at a cost far below the value of 3.7-4.2 GHz spectrum in those markets).

proposal is its mandate that all MVPD and MVPD programmer earth stations—2,600 according to the proposal—be moved from C-Band to fiber delivery. While fiber is a viable and appealing content transmission medium, the proposal leaves unanswered too many questions as to the economics and deployment schedule of the contemplated changeover, putting C-Band repurposing at risk. The proposal also provides no clear path to achieving the purpose of this proceeding: to make substantial mid-band spectrum rapidly available to meet the accelerating demand for 5G.

The record underscores many of these issues. Cable programmers and earth station operators have argued that if there is to be C-Band repurposing, satellite operators are in the best position to make that happen. Two large cable programmers, for example, urge the Commission to adopt a market-based mechanism because “other Commission-based approaches would not mitigate disruptions to the operation of impacted C-Band users and likely would impose high transaction costs directly on C-band users.”²⁵ As one earth station operator explains:

[W]e believe that a market-based approach, led by satellite operators, is the only practical solution for introducing terrestrial mobile operations in the C-band. Cable systems, broadcasters and content delivery companies have been working with satellite operators for decades. We are their customers, and they understand our needs and have direct knowledge of our operations. Consequently, satellite operators are best positioned to protect our company²⁶

And the ACA/CCA/Charter proposal does not “show its work.” For example, the proposal claims that at least 370 MHz of spectrum in all urban markets would be cleared in 18 months, the “majority” of other markets would be cleared in three years, and in five years for “a

²⁵ Comments of QVC and HSN, GN Docket No. 18-122 et al., at 5-6 (filed Oct. 29, 2018).

²⁶ Comments of Linkup Communications Corporation, GN Docket No. 18-122 et al., at 5 (filed Oct. 29, 2018) (filed as Mark A. Johnson, Karen R. Johnson).

few select areas.”²⁷ But this proposed timeline is left unsupported and key terms remain undefined. It does not define the relevant markets or explain how the spectrum will be cleared. It simply asserts that clearing “at least 370 MHz is feasible and does not impact clearing timelines.”²⁸ The proposal then concludes that 130 MHz is more than enough spectrum to satisfy non-MVPD C-Band demand, but the proposal admittedly states that this is an estimate.²⁹ Without specific metrics to guide Commission decision-making, the proposal lacks the specificity for the Commission to promptly move forward as the uncertainty runs the risk of undermining the success of the clearing plan.

Separately, the proposal’s call for a Commission-run auction minimizes significant legal questions. First, rather than providing a firm path, it says that the Commission can pursue either a traditional auction or an incentive auction. But each approach raises legal issues. Under the traditional auction proposal, ACA/CCA/Charter suggest that the FCC take back the 370 megahertz to be repurposed, conduct an auction, require winning bidders to reimburse users for relocation costs, and direct winning bidders “to compensate existing operators and users for their cost of capital based on their investments, or make incentive payments to the extent permitted by law.”³⁰ But ACA/CCA/Charter do not address potential legal arguments about the Communications Act’s limit on FCC modification of license rights under Section 316 with respect to the repurposed 370 megahertz. And they do not explain whether and how the Commission could verify and determine operators’ capital costs based on “investments.” The

²⁷ ACA/CCA/Charter Cartesian Attachment at 2.

²⁸ *Id.* at 35.

²⁹ *Id.* at 6.

³⁰ ACA/CCA/Charter Proposal at 6 (citation omitted).

proposal for “incentive payments” offers no parameters in this unprecedented payment scheme that could lead to holdout issues. This approach is rife with legal risk and market uncertainty.

And for all the reasons explained in our filings in response to the last public notice,³¹ the proposal to use an incentive auction would pose a whole set of other legal issues. The incentive auction provision, Section 309(j)(8)(G) of the Communications Act, only allows for “licensees” to agree to surrender their “licensed spectrum usage rights” in the reverse auction.³² Earth station registrants, however, do not hold “licenses” because they do not meet the statutory definition of that term.³³ They also do not hold spectrum usage rights because they do not transmit on and use spectrum.³⁴ ACA/CCA/Charter fail to overcome these legal hurdles in claiming that earth station operators are licensees.

As an operational matter, the proposal offers scant details to explain how an incentive auction would work. ACA/CCA/Charter state simply that a reverse auction satellite participant “willing to tender satellite capacity for refarming at a certain price would have to lease capacity on its satellites to an operator not willing to surrender satellite capacity at that price, as necessary to preserve the latter operator’s total satellite capacity.”³⁵ But that oversimplified statement ignores the unprecedented complexity that such an approach would require. This framework is not ready for prime time.

³¹ Comments of Verizon, GN Docket No. 18-122 et al., at 3-11 (filed July 3, 2019) (“Verizon PN Comments”); Reply Comments of Verizon, GN Docket No. 18-122, et al., at 3-4 (filed July 18, 2019) (“Verizon PN Reply”).

³² 47 U.S.C. § 309(j)(8)(G).

³³ *Id.* § 153(49).

³⁴ *Regulation of Domestic Receive-only Satellite Earth Stations*, First Report and Order, 74 F.C.C.2d 205 (1979); *see* Verizon PN Comments at 11. In a previous Public Notice, the Commission identified this legal issue. *See International Bureau and Wireless Telecommunications Bureau Seek Focused Additional Comment in 3.7-4.2 GHz Band Proceeding*, Public Notice, DA 19-385, at 4 (rel. May 3, 2019).

³⁵ ACA/CCA/Charter Proposal at 6.

A satellite operator-led market-based solution avoids these legal and practical problems and uncertainties. It is the fastest and most efficient way to achieve the principal goal of repurposing the maximum feasible amount of mid-band spectrum as soon as possible while ensuring continued delivery of existing content distribution traffic.

IV. THE FCC SHOULD REJECT A POINT-TO-MULTIPOINT SERVICE IN THE 3.7-4.2 GHZ BAND AND CONSIDER AN OVERLAY AUCTION IN THE FSS-REPACKED PORTION OF THE BAND.

A. With All of the Complex Issues that the FCC Must Resolve in This Proceeding, It Should Refrain from Taking on the Extraneous and Problematic Point-to-Multipoint Issue.

Verizon and other commenters previously demonstrated that creating a new service and awarding point-to-multipoint licenses in the 3.7-4.2 GHz band would frustrate the Commission's goal of repurposing the spectrum for flexible-use services, in which new entrants can choose to offer mobile or fixed service (including point-to-multipoint).³⁶ And C-Band satellite operators have shown that allowing point-to-multipoint operations in the repacked portion of the 3.7-4.2 GHz band will complicate frequency coordination and increase the risk of harmful interference to video downlinks.³⁷

The market, not Commission rules, should determine whether new entrants choose to offer mobile or fixed service (including point-to-multipoint). Companies that wish to offer

³⁶ See, e.g., Verizon NPRM Comments at 25-27; Joint Comments of Intel Corporation, Intelsat License, LLC, and SES Americom, Inc., GN Docket No. 18-122 et al., at 8-9 (filed Oct. 29, 2018); Comments of Qualcomm Incorporated, GN Docket No. 18-122 et al., at 6 (filed Oct. 29, 2018); Verizon PN Reply at 6-8; Reply Comments of Satellite Industry Association, GN Docket No. 18-122 et al., at 3-4 (filed July 18, 2019) ("P2MP operations also would further encumber the C-band with non-flexible-use services, making it inconsistent with the rapid deployment of 5G in the C-band and Chairman Pai's 5G FAST Plan.") (citation omitted).

³⁷ See, e.g., Comments of CBS Corporation, Discovery, Inc., The Walt Disney Company, 21st Century Fox, Inc., Univision Communications Inc., and Viacom Inc., GN Docket No. 18-122, at 10-11 (filed Oct. 29, 2018) (filed as Content Companies).

point-to-multipoint service can compete for licenses like everyone else, at the same time, and under the same rules for the repurposed spectrum in the 3.7-4.2 GHz band, or as an overlay license bidder.

The WISPA/Microsoft/Google study³⁸ raised in the *Public Notice* asserts that, by applying its unique set of questionable assumptions, point-to-multipoint operations in the band could blanket much of the U.S. population and geographic coverage. Not that such operations would, just that they could. There are, of course, multiple opportunities for point-to-multipoint deployments that would not disrupt repurposing 3.7-4.2 GHz spectrum. WISPA members, Microsoft, Google, and others can pursue opportunities in the soon-to-be-available 3.5 GHz band (including at least 80 megahertz of lightly-licensed GAA spectrum) or participate in the upcoming 2.5 GHz auction. And they surely will be exploring opportunities resulting from the Commission's pending 6 GHz proceeding as well. But there is no sound legal or policy reason to insert a new point-to-multipoint service into any part of the 3.7-4.2 GHz band. With all of the complex issues on the table that the Commission must resolve, it should not take on the additional, extraneous and highly problematic issue of creating a specific point-to-multipoint service.

B. An Overlay Auction in the FSS-Repacked Portion of the Band Would Allow Winning Bidders to Negotiate Further Spectrum Clearing for Flexible-Use Services.

The July 2018 *Notice of Proposed Rulemaking* sought comment on whether to conduct an overlay auction to repurpose 3.7-4.2 GHz spectrum, observing that terrestrial C-Band overlay

³⁸ See Letter from Claude Aiken, President & CEO, Wireless Internet Service Providers Association, Andrew Clegg, Spectrum Engineering Lead, Google LLC, and Michael Daum, Technology Policy Strategist, Regulatory Affairs, Microsoft Corp. to Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122, Attachment (filed July 15, 2019).

licensees would be “obligated to protect licensed or registered earth stations,” but they could “use any spectrum that becomes available by clearing earth stations.”³⁹ Verizon’s initial comments noted the hold-out challenges associated with relying on an overlay auction approach, as compared to a satellite operator-led transition, for quickly repurposing a significant amount of 3.7-4.2 GHz spectrum.⁴⁰ Those concerns remain today, and the Commission should adopt a satellite operator-led, market-based mechanism, with appropriate guardrails as Verizon has proposed, to repurpose hundreds of megahertz of spectrum for 5G.⁴¹

But once the process for repurposing a large portion of the band is in place, the Commission could conduct an overlay auction in the repacked portion of the band to create an opportunity to open up additional mid-band spectrum for 5G. Stakeholders could bid to acquire the right to negotiate with earth station registrants to clear the band by switching to fiber delivery of content, for example. And, as recently acknowledged in the Commission’s *2.5 GHz Report and Order*, an overlay auction approach would provide adequate protection to incumbent operations within the relevant geographic areas.⁴² Despite its “technical complexities,” it is an approach that has the potential to “maximize the potential for expansion, without disrupting

³⁹ *2018 NPRM*, 33 FCC Rcd at 6937 ¶ 64; *see id.* at 6946 ¶ 99 (“An overlay license authorizes operations for an entire geographic area but requires the licensee to protect existing incumbents from interference indefinitely, i.e., until the rights are relinquished.”) (citation omitted).

⁴⁰ Verizon NPRM Comments at 5-6.

⁴¹ *Id.* at 9-12. Many other commenters, including earth station operators and content distributors, support the market-based mechanism as the most reasonable path to repurpose 3.7-4.2 GHz spectrum. *See, e.g.*, Comments of Cisco Systems, Inc., GN Docket No. 18-122, at 3 (filed Oct. 29, 2018); Comments of Motorola Solutions, Inc., GN Docket No. 18-122 et al., at 3 (filed Oct. 29, 2018); Comments of Telecommunications Industry Association, GN Docket No. 18-122 et al., at 5 (filed Oct. 29, 2018); Comments of Aviation Spectrum Resources, GN Docket No. 18-122 et al., at 7 (filed Oct. 29, 2018); Comments of Cumulus Media Inc. and Westwood One, LLC, GN Docket No. 18-122, et al., at 14-15 (filed Oct. 29, 2018).

⁴² *See Transforming the 2.5 GHz Band*, Report and Order, FCC 19-62, ¶ 46, ¶¶ 76-77, ¶ 80 (rel. July 11, 2019).

existing licensees and lessees.”⁴³ While the hold-out problem could still exist, it will not derail repurposing a large portion of the band as it would if the Commission relied on an overlay auction approach for the entire band.

A new point-to-multipoint service would derail this overlay opportunity. It would create an ever-expanding number of new encumbrances, negating the business case to bid for an overlay license, cover the costs associated with clearing the knowable number of earth station encumbrances, and launch service. The uncertainty and risk to bidders would distort an economically efficient, market-driven result where the value of the repurposed spectrum exceeds the costs of clearing incumbents.

V. CONCLUSION.

Verizon encourages the Commission to swiftly move forward and adopt a framework for rapid repurposing of 3.7 to 4.2 GHz spectrum that includes a receiver protection threshold measured at C-Band earth station locations.

Respectfully submitted,

William H. Johnson
Of Counsel

/s/

Gregory M. Romano
VERIZON
1300 I Street, NW
Suite 500 East
Washington, DC 20005
(202) 515-2574

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⁴³ *Id.* ¶ 77, ¶ 81.